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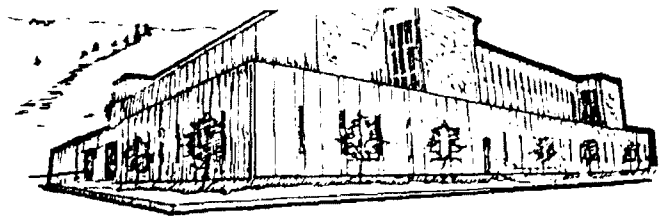

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THE LACK OF CA/IDMS TRAINING IN MONTANA STATE GOVERNMENT

by

Mary B. Anderson

Presented in partial fulfillment of the requirements

for the degree of

Master of Public Administration

University of Montana

1993

Approved by

Committee Chair

Dean, Graduate School

Dec. 28, 1993

Date

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CHAPTER 1

INTRODUCTION

PROBLEM STATEMENT

The Departments of Montana state government are experiencing enormous problems in the recruitment and retention of computer analysts and programmers who are qualified to work with Computer Associates' Integrated Database Management System (CA/IDMS). CA/IDMS is a mainframe database management system (DBMS) which was first licensed for use by the state in 1977. As a mainframe product, CA/IDMS is different than a personal computer database product such as dBase. A mainframe DBMS provides for backup, recovery, journalling of updates, storage, retrieval and output of large amounts of data, support for hundreds of concurrent users, local or remote access, and data manipulation and report languages. To date, no personal computer DBMS has all of those capabilities.

As a DBMS, CA/IDMS provides an environment in which governmental functions can be automated. When specific groups of related software programs are developed to assist the government in carrying out its business, they are referred to as "applications." For example, an application in the Department of Social and Rehabilitation Services is The Economic Assistance and Management System. This application assists in the determination of eligibility and distribution

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of benefits for the Aid to Families with Dependent Children (AFDC), Food Stamps and Medicaid programs. The application is used daily for inquiry and update by state and county personnel throughout Montana.

There are different levels of support personnel needed by the State to realize the full benefits of the CA/IDMS. One level of support personnel maintains the CA/IDMS environment itself. This level of support is centralized. "Systems Specialists" and "Database Administrator" are examples of position titles for this level of support and there are relatively few persons occupying these positions.

The second level of support personnel carries position titles such as "computer analyst" and "programmer." There are many of these positions scattered throughout the departments of the state government. These are the level of support personnel which this paper intends to address. As a DBMS, CA/IDMS has "tools" which these personnel use to develop application systems such as The Economic Assistance and Management System.

When the State recruits for the computer analyst and programmer positions, the need is to find persons with the knowledge, skills and abilities (KSA) to design, develop and maintain CA/IDMS applications. Although many application forms may be received for open positions, generally few, if any, persons qualify. For example, in a recruiting effort at the Department of Administration during the summer of 1991,

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one out of forty nine applicants possessed the requisite qualifications.[1]

When a person does qualify, that person is generally in one of two situations. Either the person is located in a state outside of Montana or the person is currently a state employee searching for an upgrade in position. Selection of a qualified, out-of-state person may add large amounts to recruiting expenses because any of the following may be paid for by the State: long distance phone calls, reasonable interview trip expenses, and reasonable moving expenses. Selection of a qualified state employee from some other agency results in turnover for the other agency, causing a ripple effect. That agency must then conduct a similar recruitment effort with similar costs and problems in finding a qualified person.

When no one in a recruiting pool fully qualifies for a position, an agency has one of two options. The agency can extend the recruiting effort and advertise again. Or, the agency can select the top person in the existing recruiting pool and then train her or him. Because recruitment of qualified individuals is rarely successful, training becomes the only viable option. It is this training, however, that is so problematic.

As the foregoing analysis suggests, there is a cycle of related recruitment, training, and retention problems with the CA/IDMS computer analyst and programmer positions.

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Recruitment generally leads to the hiring of an underqualified individual. That hiring leads to formal training, inclusive of the CA/IDMS. When the person completes CA/IDMS training, the person possesses knowledge which is marketable in Montana. The realization of marketable skills leads the highly mobile individual to search for higher pay for a similar job in Montana and, if successful, to turnover for the State. That turnover causes another recruitment effort.

It is recognized that the employee retention problem is the one biggest factor influencing training needs. Factors contributing to the retention problem include low salaries and short supply of CA/IDMS trained persons. Political recognition of the retention problem has not been achieved and, although the debate over the issue continues, it may be years away from being resolved. For the purposes of this research, it must be assumed that a solution to the employee retention problem will not occur in the short-term, and initial efforts at resolution must focus on training.

The purpose of this research is to document the problems and consequences of the lack of CA/IDMS training in Montana, and to identify, compare, and recommend alternatives for increasing the number of analysts and programmers trained to use the tools of CA/IDMS. For the purposes of this research, it is assumed that if CA/IDMS training were more readily available in the State of Montana, more persons would attend the training, there would be a resultant increase in the

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supply of persons knowledgeable to work with the system, and there would be some alleviation to the employee retention problem caused by a shortage of qualified persons.

METHODOLOGY

To document the problems and consequences of the lack of CA/IDMS training in Montana, seven (7) interviews were conducted. The individuals were interviewed because they held managerial or supervisory positions in state agencies which have CA/IDMS applications. Appendix A contains the open ended questions used to elicit interviewee responses. Appendix B lists the agencies where interviews were conducted.

In order to identify, compare, and recommend alternatives for training, a survey was conducted. The survey was mailed to fourteen (14) potential training partners. Potential partners included companies which have responded to past Montana Request For Proposal (RFP's) for training and also included campuses of the Montana university system. Appendix C contains a copy of the survey and Appendix D lists the locations to which the surveys were mailed. No names are listed because confidentiality was guaranteed.

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OUTLINE OF REMAINING CHAPTERS

The remaining chapters are organized to cover the consequences, alternative solutions, and recommendations for CA/IDMS training in Montana. Chapter 2 addresses the consequences resulting from the lack of readily available CA/IDMS training. It also describes training as previously offered and the problems associated with the methods. Chapter 3 identifies alternative solutions to the training problem and reviews the advantages and disadvantages of each alternative. Chapter 4 makes a final recommendation for the CA/IDMS training problem.

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CHAPTER 2

CONSEQUENCES OF THE LACK OF TRAINING

BACKGROUND

There are approximately fifty (50) positions in the executive branch agencies of Montana state government which require CA/IDMS knowledge.[2] Other positions requiring similar knowledge exist in the legislative branch and in private businesses in the Helena area. These positions, estimated to be about fifty (50), were not included in this research.

The Department of Revenue is an example of an executive branch agency which has used CA/IDMS as the foundation of departmental computer applications systems. The departmental CA/IDMS systems are critical to the mission of the department. In reference to shrinking revenues, increased workloads and staff reductions experienced in recent years, Denis Adams, former Director of the Revenue Department, said that "the only way the department can keep its head above water is 'through the appropriate application of technology.'"[3] The department depends on having a core of CA/IDMS knowledgeable persons to facilitate this appropriate application of technology.

It is widely recognized in the Department of Revenue and in other agencies that Montana's state government can benefit from additional automation of benefits and service delivery processes. Automation can increase the throughput of certain

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repetitive functions without an increase in the numbers of employees necessary to perform the functions. In addition, easy access to information about levels of services can pinpoint where government is succeeding or failing in its missions.

But in order to build essential information systems applications, a staff of qualified persons is needed. If existing computer groups cannot find fully qualified and trained persons, or if training cannot be obtained once persons are hired, the task of providing automation and information systems is almost impossible.

There may also be political consequences of the training problem to which politicians must be sensitive. Constituents repeatedly cry out for "jobs for our children." State agencies and local businesses have the CA/IDMS jobs to offer, but they need individuals who have been exposed to both mainframes and personal computers. Agencies need persons with academic or work experience with any of the large mainframe database software (CA/IDMS, IMS, DB2), exposure to COBOL, and an applications focus. But most Montana university system graduates do not possess these qualifications. Their education or experience is generally personal computer based, without COBOL, and with a limited applications perspective. As a result, except for trainee positions, jobs generally do not go to Montana university system graduates. Instead, jobs are awarded to persons with experience in mainframe database

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software systems.

The training problem also creates economic consequences for the state, including the direct and indirect costs of conducting each recruitment effort. In their effort to find qualified applicants, agencies advertise in newspapers both in-state and out-of-state. There is a direct cost which rises in proportion to the number of advertisements placed. In 1990, a recruitment effort at the Department of Administration included advertising in ninety-seven (97) newspapers. The direct cost of that advertising was $1600.[4]

It can be expected that a greater number of advertisements placed will result in more interest. To handle the interest, more position announcements and job application forms must be printed and mailed. As more interest is stirred, agency telephones ring more often. Incoming telephone requests for information or materials were logged for a recruitment effort at the Department of Administration in the summer of 1990. Two hundred forty (240) requests for information were received in about a two week period.[5] The number of calls illustrates that interest in the positions exists.

As more applications are received, more supervisory staff time is allocated to each recruitment effort. This cost is indirect but very real. Since all applications must be reviewed and given consideration, an entire recruitment process consumes a large amount of time and energy. Time

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spent on recruitment represents time foregone in coordinating the automation or information systems.

There are also staff productivity consequences arising from the training problem. Productivity of a person without CA/IDMS training is below that of a trained person. Generally the reduced productivity costs are hidden because they are absorbed by the costs of development or maintenance projects. Untrained persons spend more time reviewing reference manuals or asking questions. When questions are discussed, productivity is reduced for both the untrained and the trained persons. In those agencies with few CA/IDMS staff, the manager is sometimes the only person actually trained in CA/IDMS. The productivity of the manager suffers because he or she must assume the roles of both manager and trainer.

Mistakes caused by an untrained person can affect the productivity of the entire base of CA/IDMS analysts and programmers. This has occurred in the past when untrained persons, using methods of trial and error, have locked up the entire test CA/IDMS system. When the entire test system locks, it takes time to recognize what has happened and to get the test system back into operation.

State agencies are becoming dependent upon the private sector to provide the expertise in CA/IDMS necessary for the development of systems. The trend appears to be towards smaller state staffs. Although this use of the private sector may be desirable, total dependence upon the private sector is

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not. Necessary functions to be performed by CA/IDMS knowledgeable state staff include the composition of Requests For Proposal (RFP's), monitoring contracts, providing for long range plans and managing operations.

The perception of state information services managers is that for all but a few state agencies, CA/IDMS training cannot be obtained within the boundaries of the state. A limited number of agencies, recognizing the necessity of their tasks and their inability to hire fully qualified persons, have undertaken to train new employees.

AVAILABLE TRAINING METHODS

Past training methods have been varied. The Department of Administration, Information Services Division (ISD) has supplied formal training classes at cost to agencies. Other methods include on-the-job (OJT) training/mentorship, CA/IDMS video training, and CA/IDMS books and reference manuals. Each method is discussed in the following paragraphs. Generally no conditions have been attached to an employee's receipt of CA/IDMS training, such as agreeing to reimburse the agency for the cost of training if the employee leaves within a specified period of time after the training. The only "condition" is that such training must be beneficial to the agency.

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ISD Supplied Courses

When the CA/IDMS system was first introduced in the state applications programming environment, training was offered centrally through ISD. ISD staff conducted the training courses for state employees and the ISD staff was available for consultation services after the courses. Since then, because of the squeeze on staff resources, training has been offered through ISD less frequently. Most recently, ISD has issued RFP's for the training and obtained training for CA/IDMS through the private sector. In 1991, a professional training firm from Chicago won the basic CA/IDMS training contract.

Because training is offered infrequently through ISD, new employees may find it difficult to obtain the prerequisite courses they need. For example, a person new to the CA/IDMS environment might be hired after the most basic course has been offered and before a secondary course is offered. In an effort to gain some training, an agency might send such a person to a secondary course without benefit of the prerequisite course. This person, lacking the basic knowledge, may then have to struggle to keep up with the course material.

Inadequate training budgets are also a problem. Agencies attempt to spread limited training dollars among staff. Because budgets for training generally include entire

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departments or divisions, CA/IDMS training is weighed against opportunity costs of other training. Because of the relative expense of CA/IDMS training, around five hundred dollars ($500) for forty (40) hours of training, agencies have not been able to afford to send many persons to training.

Out-of-State Training

Infrequently, persons have been sent to training classes located out-of-state. Generally such travel has been to obtain more advanced training. An advantage to travelling to obtain training is the timing: training can be obtained when it is needed by a specific person. Other advantages are that the training is current with technology and the course is selected because the material is specific to the needs of the individual.

There are two main disadvantages associated with out-of-state training. The first is the prohibitive per student cost, which includes course registration, airfare, hotel, meals and other incidentals. The second disadvantage has to do with the low profile maintained when out-of-state training is warranted. Few people are aware that someone is either planning on attending training or has just returned from training. Therefore, the specifics of the training are not widely shared with others.

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On-the-Job (OJT)/Mentorship Training

In the past, both the Department of Revenue's Systems Development Bureau and the Department of Administration's Applications Services Bureau (ASB) have been able to rely on a core of internal staff to train new employees using the mentorship concept. However, in early 1990, Jeff Brandt, the Bureau Chief announced that he was "running out of qualified trainers."[6]

The number of CA/IDMS trainee positions which an agency can afford is limited by the reality of agency workload and the availability of mentors. There are three main reasons why most agencies cannot afford to hire at the trainee level: 1) there is no other qualified staff within the agency to mentor and train the trainee, 2) trainees commonly take several months to a year to become productive and an agency cannot absorb the resultant productivity loss, and 3) the risk of investment in and subsequent loss of a trainee is so great that it outweighs any possible benefit the agency could gain from hiring one.

An advantage of OJT is the tailored training a person receives. The training is tailored to the applications environment in which a person will work. Shop standards and procedures are incorporated in the training. The visible cost of OJT is minimal; OJT does not reflect directly in the budget. However, as discussed earlier, OJT costs are

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reflected in productivity losses.

There are disadvantages to reliance on OJT. First, there is a reduced likelihood that new ideas will flourish in an environment where OJT is used as the primary means of training. Second, OJT means that a person must gain employment before gaining training. A person willing to bear the expense of training (ie. time and cost) is prohibited from doing so because the training is OJT dependent and is not available to outsiders.

As one might expect, competition for the CA/IDMS trainee positions is fierce. In 1990, the Department of Administration received ninety-two (92) applications when the trainee level positions were announced.[7] In 1991, the same department received seventy-nine (79) applications when the same level of positions were announced.[8] Despite such interest, training underqualified recruits in the context of high turnover is enormously expensive.

CA/IDMS Videos

ISD owns a set of CA/IDMS video tapes for training purposes. Agencies can borrow the tapes for training and most agencies have done this. In theory, video based instruction allows a new employee to learn CA/IDMS at the office and on a schedule convenient to the employee. However, information services managers report that the videos are extremely boring

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and are not a productive use of a new employee's time. Another problem with the videos is that they are already outdated due to rapidly changing technologies. The videos can impart a basic understanding of CA/IDMS but a person cannot be expected to know the extent to which the video is out-of-date and where newer, better methods now exist. As with OJT, the videos are not accessible by the general public wishing to learn CA/IDMS.

CA/IDMS Books and Reference Manuals

Agencies generally own a set of programmer-oriented CA/IDMS reference manuals. As employees have attended formal training, other training materials have also been collected and made available to new employees. All these references have been used by persons untrained in CA/IDMS to gain a basic understanding of the system. But as with the CA/IDMS video tapes, a person cannot be expected to identify out-of-date concepts.

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PROBLEMS ANTICIPATED IN OBTAINING TRAINING

The two dominant, continuing problems anticipated in obtaining future CA/IDMS training include the timing of courses offered and limited budgets to pay for the training. Timing problems include the difficulty of obtaining prerequisite courses (because of infrequent offerings) and insufficient notification of these courses for planning purposes. Budget problems include the current fiscal situation of the state, the lack of funds available for training purposes, and the relatively high cost of CA/IDMS courses. Training also is more difficult to justify for system maintenance activities than for anticipated system development activities.

Additional problems anticipated in obtaining training include the remoteness of Montana, the non-existence of CA/IDMS training in Montana, and the almost impossible task of justifying out-of-state travel for training. At times, agencies have travel bans which restrict travelling for training purposes.

A final hurdle is the apparent lack of overall state commitment to training. Training budgets are typically the first to be eliminated in these times of severe budget cuts. It is believed that in the longer term, information systems in the state will suffer in quality and application of new technology because of the lack of training.

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PROBABLE FUTURE TRAINING NEEDS

All information services managers interviewed believe that CA/IDMS training should be more readily available within the state. Although their need to send someone to training depends on their respective turnover rates, most agencies need basic CA/IDMS training to be offered annually. Some agencies are currently experiencing a hiring freeze and cannot hire a person new to the state. Nevertheless, they can still use the training to "retool" a person already familiar with the concepts of programming a computer. Because of travel restrictions, agencies need CA/IDMS training offered in Helena.

EXPECTED BENEFITS

All information services managers expect that training will lead to substantial gains in staff productivity. Most believe that increases in general knowledge about CA/IDMS will enable staff to make better decisions in the appropriate application of technology. Several managers said that readily available training would free them from having to do the training and that they would have more time to attend to other job responsibilities. One person interviewed said that CA/IDMS training would facilitate the introduction of new ideas into the workplace: new employees, for example, could

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introduce techniques about which current employees may not be aware. A final benefit of readily available training is that if agencies knew ahead of time that training would be available when needed, agencies could incorporate the training into their plans and budgets.

This chapter has established the lack of availability of CA/IDMS training, the consequences that result, and the clear need for additional training programs. Chapter 3 will describe and assess alternative solutions.

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CHAPTER 3

TRAINING ALTERNATIVES

OVERVIEW

This chapter identifies four potential solutions to the CA/IDMS training problem and reviews the advantages and disadvantages associated with each alternative. The first alternative addresses the continuation of the current varied and miscellaneous means of training. The second alternative discusses the changing of technologies to resolve the problem. The third and fourth alternatives provide a specific direction for training: the third alternative suggests development of partnerships with the business community; the fourth alternative suggests the implementation of a campus-government linkage (CGL).

The third and fourth alternatives are similar because they suggest that the State band together with other entities to meet the needs for training. In an attempt to discover evidence of a cottage industry for partnerships in technical training, a survey was sent to fourteen (14) potential partners. In total, seven (7) potential partners responded to the survey. The majority of respondents, seventy-one (71) percent, had little interest in a training partnership or linkage with the State. A minority of respondents, the other twenty-nine (29) percent, did express interest in a training

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partnership or linkage. One of those interested already does offer CA/IDMS training.

ALTERNATIVE 1 - STATUS QUO

The first alternative to the training problem is to continue the current varied and miscellaneous training methods. The advantage to this alternative is that it requires little or no effort to implement. The obvious disadvantage to this alternative is the failure of the present methods to efficiently generate many persons trained in CA/IDMS.

If the State decides to continue using the miscellaneous methods of training, agencies should at least devise a means to share ideas and experiences of the CA/IDMS technology. This sharing of technology is of greater importance to the agencies with small CA/IDMS programming staffs. In the agencies with larger staffs, it is normal for staff to informally discuss design strategies, to share positive and negative experiences, and to offer insights to one another. Employees from smaller staffs need the same opportunities for information exchange with other persons trained in CA/IDMS.

Another method of training which should supplement the existing methods is the dissemination of information gathered at out-of-town training. Those who travel to obtain training should collect issues or topics of concern from others.

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Attempts should be made to obtain answers or solutions. Upon returning from the training, others should be briefed on information collected. There are many mediums through which this briefing could occur, including electronic mail, data processing newsletters, and "brown bag" lunches.

ALTERNATIVE 2 - CHANGE OF TECHNOLOGY

It has been suggested that in order to eliminate the problem of obtaining training for CA/IDMS, the state need only change technology away from CA/IDMS towards another technology. It is safe to assume that the number of technological options available to the state are as numerous as the technologists who desire to offer an opinion.

The survey conducted for this paper does not show any consistency in readily available training for DBMS's. Of the seven (7) potential training partners who responded to the survey, none offer the same mainframe based training that can be obtained from one of the others. In fact, six (6) different mainframe products, including CA/IDMS, and six (6) different personal computer products are being taught by the potential training partners. Only two (2) of the responding potential training partners offer training on one of the same personal computer based products. Because the survey revealed that there is no consistency in existing DBMS training, it is assumed that the problems experienced attempting to gain

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CA/IDMS training will extend to any other DBMS.

Sometime in the future the state may make a strategic technological decision to move away from CA/IDMS and towards another DBMS product. But even when such a decision is made, the state will still need persons trained in CA/IDMS. The state has a significant investment in application systems developed with CA/IDMS. If calculated, the total development cost in dollars and the total lines of programming language code for those systems would be in the millions. System by system, decisions must be made to retain legacy systems in CA/IDMS or to convert them to the newly chosen technology. Whether systems are retained or converted, the state will need CA/IDMS trained persons to maintain or convert the systems. A change in technologies will not quickly resolve the training problem; it will only redefine it.

ALTERNATIVE 3 - DEVELOP BUSINESS PARTNERSHIPS

In an independent study of technical training, it was found that seventy-five (75) percent of the businesses surveyed have some technical training conducted by outside training companies.[9] Through the training contracts that ISD has arranged, the state also has successfully made use of outside training companies.

This third alternative suggests one of two options: first, that the state enter into a partnership with a

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corporation to develop training specifically designed for the State of Montana, or second, that the state attempt to enter into a training consortia with other entities needing similar training.

Before entering into a partnership with a business, the state will probably need to issue a Request for Proposal (RFP). Previous training RFP's have focused specifically on conducting CA/IDMS training. It was determined that very few businesses have an affordable, made-for-Montana, CA/IDMS training package. An RFP aimed at establishing a partnership should have two components, one which addresses partnership in the design of training and one which addresses the actual training itself. The RFP should be issued for an extended period of time to allow the partnership to meet different training needs as technology changes and as employees change or grow.

Advantages to a business partnership in training include the customization of the courses to the needs of the state, the specification of training frequencies and location, and the fact that no new state employees would need to be hired as trainers. Disadvantages to a business partnership include the administrative process which requires reissuance of the RFP after a specified period of time and that the training would not be available to those who are not employees of the state.

The other business partnership option is pursuit of a training consortia. A limited training consortia exists now

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because ISD attempts to supply courses in which several state agencies are interested. This concept could be expanded to allow the government sector to be one of several employers requiring training for employees. The state could pool its training resources with other businesses with the potential that all involved in the consortia would realize volume discounts for the CA/IDMS training. Also, other technology training might evolve through the consortia giving state employees access to training that otherwise would not be available.

Disadvantages to the training consortia vary, depending upon which other businesses join it, their technological needs and where they are located. Most likely, the businesses in Helena wishing to pool resources for CA/IDMS training will be few in number. For this reason, formation of a consortia might involve extending the participation to businesses located outside of Helena, thus increasing the potential need for state employees to travel to obtain training. As with other training options previously identified, training through a consortia probably would not be available to persons who are not employees of the government or businesses participating in the consortia.

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ALTERNATIVE 4 - DEVELOP CAMPUS/GOVERNMENT LINKAGE

Acknowledging that a mutually beneficial interest exists, schools and businesses are entering into relationships with each other.[10] A campus-government linkage (CGL) is such a relationship between a university or college campus and a branch of government.

> [L]eaders are beginning to redefine the dilemma of education as a dilemma that communities - not just educators - must solve. For their part, the schools, traditionally suspicious of outside intervention, are starting to view business as a formidable community ally at a time when they desperately need one.[11]

IBM and the Motorola Corporation are examples of technical corporations which have developed linkages with schools in an attempt to keep employees trained. Faced with recruitment difficulties, Motorola adopted a policy which maintained that everyone had a right to retraining when technology changed.[12] Motorola turned to community colleges and other local institutions for help with training and developed mutually beneficial educational partnerships, a campus-business linkage.[13]

A CGL can benefit a university or college by increasing the number of students attending courses, with an accompanied increase in income. A linkage could provide an additional avenue for faculty and staff development. It also could be managed as service to the community at large.[14]

The state could benefit from a CGL for CA/IDMS training by an increase in the availability of training for both

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traditional and nontraditional students, employees and non-employees. An increase in the availability of training could lead to more qualified employees and more qualified pools of job applicants. If students work on government assignments during their training period, the state may benefit from a more motivated employee during that time. Potentially, better training could be offered because the talents of formal educators would be used rather than relying on persons who may not be qualified to teach.

A CGL is not co-operative education, but it can exist alongside a co-op program. Students gain through a CGL because they are given practical training and experiences, and they can earn pay while working. When they graduate, students have experience which is directly applicable to the market in which they live.

Disadvantages of the CGL include the extra work that both the academic and government communities incur in order to define the linkage. Depending upon assignments, students may require discontinuous segments in school, perhaps taking longer to complete their education. In the context of CA/IDMS training, a disadvantage is that the academic community must lock into a technology which they may not have chosen or like.

SURVEY RESULTS

As noted previously, seven (7) of fourteen (14) potential

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training partners responded to the survey. Raw survey data is reported in Appendix E.

The survey was designed primarily to reveal the characteristics that CA/IDMS training would have, if it was to be conducted by any of the potential training partners. The layout of the survey was such that the information pertaining to characteristics would only be collected from interested respondents. As a result, information was obtained only from the two respondents that expressed interest in a relationship. The characteristics of training that were revealed by their responses follow.

CA/IDMS training would be offered to both state and non-state employees. It would be conducted within Montana. Six (6) to ten (10) persons would be taught at once. The training would be instructor led with the instructor available in-person. It would be offered two (2) to four (4) times annually. On a per student basis for forty (40) hours of training, the cost would be in the range of two hundred fifty dollars ($250) to one thousand dollars ($1000). There was a slight preference that student owned personal computers not be used as the environment in which to conduct the CA/IDMS lab exercises.

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SUMMARY

This chapter has identified several alternatives as potential solutions to the CA/IDMS training problem in the State of Montana. All of the alternatives are accompanied by their respective advantages and disadvantages. None are flawless in design. Chapter 4 will make a final recommendation to the training problem based on an alternative presented in this chapter.

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CHAPTER 4

RECOMMENDATIONS

BEST ALTERNATIVE

To meet the objective of increasing the number of persons trained in CA/IDMS, it is recommended that the State of Montana pursue a CGL with a campus of the Montana University System. This linkage is the only alternative which has the potential to increase the supply of CA/IDMS trained persons by training both state employees and non-state employees. The CGL should begin as a small project that is CA/IDMS training centered, and should be designed as a fluid linkage, expanding to other areas as additional needs are defined.

As illustrated by the responses to the survey (Appendix E), staff at the majority of the campuses will not wish to pursue a CA/IDMS training-centered linkage; however, there is the possibility that the staff of at least one campus will wish to pursue the linkage. If no unit of the Montana University System wishes a CGL, then the private colleges in Montana should be tapped.

The CGL should be enhanced by establishing a co-operative education program whereby students can gain practical experience. Such experiences can help a student discover insights into the field in which she or he is studying and possibly gain additional value out of the formal education.

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Pursuit of a CGL for CA/IDMS training within the boundaries of the State of Montana will help to alleviate the problems caused by a shortage of trained persons. Creativity and commitment will make the linkage a success for both academia and the government.

REJECTED ALTERNATIVES

The other alternatives were rejected primarily because they do not allow non-state employees to receive CA/IDMS training. The business partnership alternative has already been tried and remains a viable option if a linkage cannot be established. But because the business partnership has not trained non-state employees in the past, the alternative was not selected as the final recommendation.

The status quo was rejected as an alternative because information services managers report that they are losing ground with respect to CA/IDMS training. The additional methods of information dissemination listed in Chapter 3 will aid current staff in remaining technologically current but will not aid new employees in receiving adequate training.

The alternative to change to a different technology was rejected because of the significant investment in CA/IDMS which has already been made. The survey revealed that there would be problems obtaining training for any DBMS, not just

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CA/IDMS. A change in technology solely to avoid CA/IDMS training would only add to the state's problems.

ADDITIONAL RESEARCH

The survey results revealed that a majority of respondents were not interested in developing or conducting CA/IDMS training. Further study could be designed to reveal why so little interest exists. Perceived factors could be monetary, technological, location, workload, or lack of appreciation for the impact of the training problem.

The interviews focused on management and employees within the state government. Because the focus was on definition of the CA/IDMS training problem, the interviews did not include a sampling of the opinions of non-state employees who might be seeking CA/IDMS training. In further defining a CGL, those who represent these persons should be consulted.

Another area for additional research is the funding of a CA/IDMS training CGL. It has been demonstrated that the state government stands to benefit from the linkage and the training. It is assumed that Montana businesses could also benefit from the training. The question remains as to how the government and interested businesses could pool financial resources to make the linkage and training possible.

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APPENDIX A

INTERVIEW QUESTIONS

Interviews were conducted to document the problems and consequences of the lack of CA/IDMS training in Montana. The interviews were formal and used the list of questions presented below.

1. Please comment on my assumption that there is a shortage of CA/IDMS trained persons in any pool of applicants for a position requiring CA/IDMS.

2. How many positions do you have which require the incumbent to be trained in basic CA/IDMS tools?

3. Describe you training methods, suppliers and typical costs associated with basic CA/IDMS training.

4. How often do you need to send someone to basic CA/IDMS training?

5. What, if any, conditions do you put on an employee's receipt of CA/IDMS training?

6. What are your future needs and plans for basic CA/IDMS training?

7. What problems do you anticipate in obtaining this training?

8. If basic CA/IDMS training were readily available, what benefits would you accrue?

9. Open for other comments...

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APPENDIX B

INTERVIEW LOCATIONS

The following is a listing of the locations and individuals interviewed regarding the problems and consequences of the lack of CA/IDMS training in Montana.

1. Department of Administration, Mr. Jim Sheehy, DP Manager, Application Services Bureau
2. Department of Administration, Mr. Ron Baldwin, DP Manager, Application Services Bureau
3. Department of Family Services, Ms. Pat Gaydos, Bureau Chief, Information Systems Bureau
4. Department of Fish, Wildlife and Parks, Mr. John Hawe, Section Supervisor
5. Department of Justice, Mr. Barney Benkelman, DP Manager
6. Department of Revenue, Ms. Brenda Haseman, Administrator, Data Processing Division
7. Department of Social and Rehabilitation Services, Mr. Ken Curtiss, Bureau Chief, Data Processing Bureau

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APPENDIX C

SURVEY

(Return address and date)

(Company representative name
and address)

Dear (name):

My name is Mary B. Anderson. I am a graduate student in the Masters of Public Administration degree program through the University of Montana. I am conducting a research project and am in need of your assistance.

Please pass the enclosed survey to your most appropriate technical training staff person. Have that person fill out the questionnaire and return it to me in the enclosed self-addressed, stamped envelope. A response mailed to me by September 15, 1993 would be most useful.

Thank you in advance for the time you allow to be spent participating in this research.

Very Truly Yours,

Mary B. Anderson

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RESEARCH BACKGROUND

This research is being conducted to assist the State of Montana in determining options to train new or existing programming staff in the use of the Computer Associates' Integrated Database Management System (CA/IDMS). CA/IDMS originated as a mainframe based database management system. Versions now exist for micro- and mid-range computers as well as mainframe computers.

It is assumed that the following items and topics would need to be covered through training:

Data structure tools and diagrams (ie, records, sets, tables)
Data manipulation language (ie, obtain, store, modify)
Integrated data dictionary (ie, maintenance of data definitions)
Module editor (ie, program source editor)
Online mapping (ie, screen builder)
Dialogs (ie, individual program flow)
Applications (interaction of multiple dialogs to accomplish a business function)

DISCLAIMER

This survey is being conducted as a part of academic research. No part of this survey may be construed as a commitment to services, costs, or course participants on behalf of either the respondent or the researcher. Confidentiality of survey responses is guaranteed.

INSTRUCTIONS

Read each question carefully. Respond in the manner most appropriate to your company or university situation. To clarify your response, add free form text to your answers.

In responding to the survey questions, assume that course participants have a four-year college degree in a business, computer science or math curriculum. Also assume that course participants have no previous CA/IDMS experience.

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SURVEY

1. Currently our company/university offers technical computer training on **personal computer based database systems.** (Check the most appropriate answer.)

   _ Yes _ No

   If you responded yes, please list the database systems below.

   _____
   _____
   _____

2. Currently our company/university offers technical computer training on **mainframe computer based database management systems.** (Check the most appropriate answer.)

   _ Yes _ No

   If you responded yes, please list the database systems below.

   _____
   _____
   _____

3. As a respondent, I am familiar with the CA/IDMS system and concepts. (Check the most appropriate answer.)

   _ Yes _ No

4. Our company/university would like to pursue a partnership with the State to **develop** different training courses specific to CA/IDMS. (Check the most appropriate answer.)

   _ Yes _ No

5. Our company/university would like to pursue a partnership with the State to **conduct** different training courses specific to CA/IDMS. (Check the most appropriate answer.)

   _ Yes _ No

If you have responded "No" to both questions 4 and 5, please

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STOP here. Return your survey responses to me in the self-addressed, stamped envelope provided. Thank you for your participation.

6. Rank the following methods of training in order of preference for conducting such CA/IDMS technical training. Add any other methods of training which you consider feasible, and include them in your ranking. (Indicate 1 for your most preferred method of technical training, 2 for your second most preferred method and so forth.)

_ Correspondence
_ Computer based
_ In-person with instructor
_ Pre-recorded video
_ Remote instructor, interactive video
_ _____
_ _____
_ _____

7. Our company/university would make available the same CA/IDMS technical training to both state employees and non-state employees. (Check the most appropriate answer.)

_ Yes _ No

8. Rank the frequency that such CA/IDMS technical training likely would be offered. For the purposes of this question, assume one course which covers identical information. (Indicate 1 for the most likely frequency of training, 2 for the second most likely frequency and so forth.)

_ Less than once per year
_ Once per year
_ Two to four times a year
_ More than four times a year

9. Rank the alternative environments in which to conduct the CA/IDMS lab exercises. Assume that there are different hardware and software alternatives for the purposes of conducting CA/IDMS lab exercises. Assume that software licensing and associated cost issues can be resolved. (Indicate 1 for the most preferred alternative, 2 for the second most preferred and so forth.)

_ Student owned personal computers

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_ Company/university lab computers
_ State training lab computers
_ _____
_ _____

10. Approximate the tuition cost for one student to participate in forty hours of CA/IDMS technical training. Ignore any additional costs associated with travel, book or reference materials. (Indicate 1 for the most likely per student cost, 2 for the second most likely student cost and so forth.)

_ Between $ 0 - $249
_ Between $250 - $499
_ Between $500 - $749
_ Between $750 - $999
_ More than $1000

11. Rank where instructor based training would most likely be conducted. (Indicate 1 for the most likely location of training, 2 for the second most likely location and so forth.)

_ In Montana, in Helena
_ In Montana, not in Helena
_ In a location outside of Montana

12. Rank the most preferred number of persons per course. (Indicate 1 for the most preferred course size, 2 for the second most preferred and so forth.)

_ Less than 5 participants
_ 6 - 10 participants
_ 11 - 15 participants
_ 16 - 20 participants
_ More than 20 participants

THANK YOU!

The time, reflection and responses which you have just given this survey are vital to this research. I sincerely thank you for your participation!

And again, be sure to return your survey responses to me in the self-addressed, stamped envelope provided.

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APPENDIX D

SURVEY LOCATIONS

The following lists the fourteen (14) potential training partners to which surveys were mailed. Because confidentiality was guaranteed, no names are listed.

Company Locations:

1. ACI Technology Training Div
   Automated Concepts Incorporated
   8750 West Bryn Mawr Ave.
   Suite 720E
   Chicago, IL 60631

2. Education Services Group
   Keane, Inc.
   2901 Metro Drive, Ste. 525
   Bloomington, MN 55425

3. Data Base Architects, Inc.
   3121 Route 22 East, Suite 212
   Somerville, NJ 08876

4. Sales and Marketing Manager
   Advanced Information Technology, Inc.
   4825 Quaker Lane N.
   Minneapolis, MN 55442

5. GE Consulting Services Corp.
   17 Computer Drive West
   Albany, NY 12205

6. Account Manager
   Computer Associates
   7050 Union Park Center, Ste 410
   Midvale, UT 84047

7. Garant and Associates
   924 Incline Way, Ste. 4H
   Incline Village, NV 89451

8. INOVA Systems, Inc.
   10201 Wayzata Blvd., Suite 320
   Minnetonka, MN 55305

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Montana University System Locations:

1. Computer Information Systems
   Northern Montana College
   Havre, MT 59501

2. Math & Computer Sciences Div.
   Montana College of Mineral Science and Technology
   Butte, MT 59701

3. Eastern Montana College
   Computer Center
   1500 North 30th Street
   Billings, MT 59101

4. Business & Technology Div.
   Western Montana College
   Dillon, MT 59725

5. Computer Science Dept.
   University of Montana
   Missoula, MT 59801

6. Dept. of Computer Science
   Montana State University
   Bozeman, MT 59717

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APPENDIX E

DATA COLLECTED FROM SURVEY RESPONSES

1. Currently our company/university offers technical computer training on **personal computer based database systems.** (Check the most appropriate answer.)

3	Yes	4	No

If you responded yes, please list the database systems below.

1	CA/Clipper	1	Recital
1	Access	1	dBase III
1	RDB	2	Paradox

2. Currently our company/university offers technical computer training on **mainframe computer based database management systems.** (Check the most appropriate answer.)

4	Yes	3	No

If you responded yes, please list the database systems below.

1	SQL-Paradox	1	DB/2
1	VAX RDB/VMS	1	Recital
1	CA/IDMS	1	IMS

3. As a respondent, I am familiar with the CA/IDMS system and concepts. (Check the most appropriate answer.)

3	Yes	4	No

4. Our company/university would like to pursue a partnership with the State to **develop** different training courses specific to CA/IDMS. (Check the most appropriate answer.)

2	Yes	5	No

5. Our company/university would like to pursue a partnership with the State to **conduct** different training courses specific to CA/IDMS. (Check the most appropriate answer.)

2	Yes	5	No

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6. Rank the following methods of training in order of preference for conducting such CA/IDMS technical training. Add any other methods of training which you consider feasible, and include them in your ranking. (Indicate 1 for your most preferred method of technical training, 2 for your second most preferred method and so forth.)

3,5 Correspondence
2,4 Computer based
1,1 In-person with instructor
3,5 Pre-recorded video
2,4 Remote instructor, interactive video

7. Our company/university would make available the same CA/IDMS technical training to both state employees and non-state employees. (Check the most appropriate answer.)

2 Yes 0 No

8. Rank the frequency that such CA/IDMS technical training likely would be offered. For the purposes of this question, assume one course which covers identical information. (Indicate 1 for the most likely frequency of training, 2 for the second most likely frequency and so forth.)

3,4 Less than once per year
2,3 Once per year
1,1 Two to four times a year
2,4 More than four times a year

9. Rank the alternative environments in which to conduct the CA/IDMS lab exercises. Assume that there are different hardware and software alternatives for the purposes of conducting CA/IDMS lab exercises. Assume that software licensing and associated cost issues can be resolved. (Indicate 1 for the most preferred alternative, 2 for the second most preferred and so forth.)

2,3 Student owned personal computers
1,2 Company/university lab computers
1,3 State training lab computers

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10. Approximate the tuition cost for one student to participate in forty hours of CA/IDMS technical training. Ignore any additional costs associated with travel, book or reference materials. (Indicate 1 for the most likely per student cost, 2 for the second most likely student cost and so forth.)

3,5	Between $ 0 - $249
1,4	Between $250 - $499
2,3	Between $500 - $749
1,4	Between $750 - $999
2,5	More than $1000

11. Rank where instructor based training would most likely be conducted. (Indicate 1 for the most likely location of training, 2 for the second most likely location and so forth.)

1,2	In Montana, in Helena
1,2	In Montana, not in Helena
3,3	In a location outside of Montana

12. Rank the most preferred number of persons per course. (Indicate 1 for the most preferred course size, 2 for the second most preferred and so forth.)

4,5	Less than 5 participants
1,1	6 - 10 participants
2,2	11 - 15 participants
3,4	16 - 20 participants
4,5	More than 20 participants

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